

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): An image reading method which reads an image on an image recording medium by a visible light, comprising the steps of:

reading a specified detecting light by scanning the detecting light in a first one-dimensional direction using an optical path of the said visible light; wherein the specified detecting light is one-dimensionally read in a second direction which is perpendicular to the first direction of the scanning and the one-dimensional reading is continued during the scanning;

determining from the read detecting light whether light quantity data of the one-dimensionally read detecting light contains a portion where the light quantity data changes identically at an identical reading position when the one-dimensional reading is continued; and

detecting at least one of a foreign matter which adheres and a scratch which exists on an optical element forming in the optical path of the said visible light based on the result of the determining continuity of change of light quantity data of the thus read specified detecting light in said one dimensional direction.

2. (canceled).

3. (currently amended): The image reading method according to claim 1, wherein the one-dimensional reading is performed by a line sensor at least one of the foreign matter which adheres and the scratch which exists in said optical path is detected by detecting the change of the

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

~~light quantity data in a line shape in a same sensor position by means of a line sensor for said specified detecting light.~~

4. (currently amended): The image reading method according to claim 3, wherein the scanning in said one dimensional direction for reading said specified detecting light by making use of the optical path of said visible light is performed by allowing the said image recording medium and the said line sensor to move relatively by ~~means of~~ transferring the said image recording medium in relation to the said line sensor, ~~or by reading said specified detecting light with said line sensor for a specified period of time in a same way as in a case of the scanning for the reading by means of transferring said image recording medium in relation to said line sensor, if said image recording medium is disposed outside of said optical path.~~

5. (currently amended): The image reading method according to claim 3, wherein the scanning which reads an image on an image recording medium by a visible light, comprising the steps of:

~~reading a specified detecting light by scanning the detecting light in a one dimensional direction using an optical path of said visible light; and~~

~~detecting at least one of a foreign matter which adheres and a scratch which exists in the optical path of said visible light based on continuity of change of light quantity data of the thus read specified detecting light in said one dimensional direction;~~

~~wherein at least one of the foreign matter which adheres and the scratch which exists in said optical path is detected by detecting the change of the light quantity data in a line shape in a sensor position of a line sensor for said specified detecting light;~~

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

~~wherein scanning in said one-dimensional direction for reading said specified detecting light by making use of the optical path of said visible light is performed by allowing said image recording medium or said specified detecting light and said line sensor to move relatively by means of scanning by transferring a mirror reflecting the specified detecting light in the said optical path.~~

6. (currently amended): The image reading method according to claim 1, further comprising the step of issuing an alarm, when at least one of the foreign matter ~~which adheres and or~~ the scratch ~~which exists in the said~~ optical path is detected.

7. (canceled).

8. (currently amended): The image reading method according to claim ~~7~~1, wherein ~~the said~~ optical element is at least one of a diffusion plate and a mirror.

9. (currently amended): The image reading method according to claim ~~7~~1, wherein a position of ~~the said~~ optical element is changed in accordance with a detection result of at least one of the foreign matter and the scratch ~~which adheres to or exists on the optical element in the said optical path.~~

10. (currently amended): The image reading method according to claim 1, wherein a detection ~~an area~~ for detecting in which at least one of the foreign matter ~~which adheres~~ and the scratch ~~which exists in the said optical path is detected, is enlarged~~ adjusted.

11. (currently amended): The image reading method according to claim 1, wherein ~~the said~~ specified detecting light is ~~the said~~ visible light.

12. (currently amended): The image reading method according to claim 11, wherein, ~~when said visible light is read by scanning in said one-dimensional direction by making use of~~

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

~~the optical path of said visible light, said~~ the image recording medium is removed from the optical path of the said visible light, before the visible light is scanned.

13. (currently amended): The image reading method according to claim 1, wherein the said specified detecting light is an invisible light.

14. (currently amended): The image reading method according to claim 1, further comprising the steps of:

reading a specified detecting light by scanning an invisible light; and
detecting at least one of a foreign matter which adheres and a scratch which exists on the recording medium by the invisible light ~~wherein at least one of the foreign matter and the scratch on said image recording medium is detected by the invisible light.~~

15. (currently amended): The image reading method according to claim 14, wherein focusing positions of the said specified detecting light and the said invisible light are different ~~changed from one another in accordance with whether at least one of the foreign matter which adheres and the scratch exists in said optical path is detected by said specified detecting light or at least one of the foreign matter and the scratch on said image recording medium is detected by said invisible light.~~

16. (currently amended): The image reading method according to claim ~~15~~ 14, wherein the said specified detecting light is identical to the invisible light, and wherein focusing positions of the said invisible light are different ~~changed~~ from one another between the time when in ~~accordance with whether~~ at least one of the foreign matter which adheres and the scratch which exists on the optical element forming in the said optical path is detected by the said invisible

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

light ~~and the time when~~ ~~or~~ at least one of the foreign matter and the scratch on ~~the said~~ image recording medium is detected by ~~the said~~ invisible light.

17. (currently amended): An image reading apparatus, comprising:
a first reading unit for reading an image on an image recording medium by a visible light;
a second reading unit for reading a specified detecting light by scanning the specified detecting light in a first direction using it in a one-dimensional direction by making use of an optical path of the said visible light, wherein the second reading unit one-dimensionally reads the specified detecting light in a second direction which is perpendicular to the first direction of the scanning and continues the reading during the scanning; and

a first detecting unit ~~for detecting~~ which determines from the read detecting light whether light quantity data of the one-dimensionally read detecting light contains a portion where the light quantity data changes identically at an identical reading position when the one-dimensional reading is continued and which detects at least one of a foreign matter which adheres and a scratch which exists ~~in~~ on an optical element forming the an optical path of the said visible light based on the result of the determining continuity of change of light quantity data of the specified detecting light used by said second reading unit in said one-dimensional direction.

18. (canceled).

19. (currently amended): The image reading apparatus according to claim 17, wherein ~~the said~~ second reading unit comprises a line sensor and a moving device for relatively moving ~~the said~~ specified detecting light in ~~said one-dimensional~~ the first direction in relation to ~~the said~~ line sensor, and wherein ~~the said~~ first detecting unit detects at least one of the foreign matter

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

~~which adheres~~ and the scratch ~~which exists in said optical path~~ by detecting the change of the light quantity data in a line shape ~~at in a constant same~~ sensor position of ~~the said~~ line sensor.

20. (currently amended): The image reading apparatus according to claim 19, wherein ~~the said~~ second reading unit allows ~~the said~~ image recording medium and ~~the said~~ line sensor to move relatively by transferring ~~the said~~ image recording medium in relation to ~~the said~~ line sensor by means of the moving device, ~~or by reading said specified detecting light with said line sensor for a specified period of time in a same way as in a case of the scanning for the reading by means of transferring said image reading medium in relation to said line sensor, if said image recording medium is disposed outside of said optical path.~~

21. (currently amended): The image reading apparatus according to claim 19, wherein ~~the said~~ second reading unit scans ~~allows said image recording medium or said the specified detecting light and said line sensor to move relatively by means of scanning~~ by transferring ~~a the mirror reflecting the specified detecting light in the said optical path with said the moving device.~~

22. (currently amended): The image reading apparatus according to claim 17, further comprising an alarming device for issuing an alarm when ~~said the~~ first detecting device detects at least one of the foreign matter ~~which adheres~~ and the scratch ~~which exists in the said~~ optical path.

23. (canceled).

24. (currently amended): The image reading apparatus according to claim ~~23~~17, wherein ~~the said~~ optical element is at least one of a diffusion plate and a mirror.

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

25. (currently amended): The image reading apparatus according to claim ~~23~~17, further comprising a first changing device for changing a position of ~~the said~~ optical element when ~~the said~~ first detecting unit detects at least one of the foreign matter and the scratch ~~which adheres to or exists on the optical element~~ in ~~the said~~ optical path.

26. (currently amended): The image reading apparatus according to claim 17, further comprising an ~~enlarging-adjusting~~ device for adjusting a detection ~~enlarging an area for detecting in which~~ at least one of the foreign matter ~~which adheres~~ and the scratch ~~which exists in the said~~ optical path ~~is detected~~.

27. (currently amended): The image reading apparatus according to claim 17, wherein ~~the said~~ first detecting unit uses ~~the said~~ visible light as ~~the said~~ specified detecting light.

28. (currently amended): The image reading apparatus according to claim 27, wherein ~~said second reading unit reads said visible light by scanning in said one dimensional direction by making use of the optical path of said visible light in a state that said~~ the image recording medium is removed from the optical path of the said visible light, before the second reading unit reads the visible light.

29. (currently amended): The image reading apparatus according to claim 17, wherein ~~the said~~ first detecting unit uses an invisible light as ~~the said~~ specified detecting light.

30. (currently amended): The image reading apparatus according to claim 17, further comprising a second detecting unit for detecting at least one of ~~the~~ a foreign matter and the scratch on ~~the said~~ image recording medium by the invisible light.

31. (currently amended): The image reading apparatus according to claim 30, further comprising a second changing device for changing focusing positions of ~~the said~~ specified

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

detecting light and ~~the said-visible light from one another~~ in accordance with whether at least one of the foreign matter ~~which adheres~~ and the scratch ~~which exists in~~ on the optical element ~~said optical path~~ is detected by the invisible light ~~said-specified detecting light~~ or at least one of the foreign matter and the scratch on ~~the said~~ image recording medium is detected by the said invisible light.

32. (currently amended): The image reading apparatus according to claim 30, wherein ~~the said~~-first detecting unit and ~~the said~~-second detecting unit are identical to each other using the said-invisible light; further comprising:

a second changing device for changing focusing positions of the said-invisible light ~~from one another~~ in accordance with whether at least one of the foreign matter ~~which adheres~~ and the scratch ~~which exists in said optical path~~ is detected by the said-invisible light, on the optical element or ~~at least one of the foreign matter and the scratch on the said~~ image recording medium ~~is detected by said invisible light~~.

33. (currently amended): A method of discriminating a defect of image data produced from an image which has been formed on an image recording medium, comprising:

a first detecting step of detecting a first optical defect existing on an optical element forming in an optical system which reads the said-image data from the said-image recording medium; and

a second detecting step of detecting a second optical defect existing on the said-image recording medium.

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/657,272

34. (currently amended): The method of discriminating defect of the image data according to claim 33, wherein ~~the said~~ first and second detecting steps are performed based on a ~~the same~~ detecting method using an invisible light.

35. (currently amended): The method of discriminating the defect of image data according to claim 34, wherein, in ~~the said~~ first detecting step, a focusing position of ~~the said~~ invisible light is set on ~~the said~~ image recording medium, and ~~wherein, in the said~~ second detecting step, the focusing position of ~~the said~~ invisible light is changed ~~removed~~ from ~~the said~~ image recording medium.

36. (currently amended): The method of claim 1, further comprising irradiating an image-bearing portion of the recording medium simultaneously with reading by scanning the specified detecting light onto the image-bearing portion.

37. (currently amended): The apparatus of claim 17, wherein an image-bearing portion of the recording medium is irradiated simultaneously with reading by scanning the specified detecting light onto the image-bearing portion.

38. (currently amended): The method of claim 33, further comprising irradiating an image-bearing portion of the recording medium simultaneously with reading by scanning the specified detecting light onto the image-bearing portion.